

TAXONOMIC FERN NOTES. IV.
SOME AMERICAN VITTARIOID FERNS

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1. THE GENUS POLYTAENIUM

The genera *Antrophyum* (*sens. str.*), *Polytaenium* and *Scoliosorus* are all closely related and have been variously united or segregated. Benedict¹ in 1907 treated all of them in the genus *Antrophyum*, a classification that followed most previous authors (*Polytaenium* and *Scoliosorus* being only rarely accepted as valid segregates). This traditional treatment was also followed by C. Christensen². Four years after his first publication, however, Benedict³ recognized two genera: *Polytaenium* (including *Scoliosorus*) and *Antrophyum*. Copeland⁴ in 1947 recognized all three genera. The pertinent characters of these genera are the following:

Antrophyum Kaulf. Enum. Fil. 197. 1824. Type: *A. reticulatum* (Forst.) Kaulf.

Costa absent or extending ca. $\frac{1}{2}$ way toward the apex of the lamina, rarely (in some plants of *A. subfalcatum*) extending ca. $\frac{3}{4}$ ths toward the apex; paraphyses present, with slender, pointed apical cells (*A. alatum*, *A. callifolium*, *A. reticulatum*, etc.) or with enlarged, rounded apical cells (*A. latifolium*, *A. Ledermanii*, *A. subfalcatum*, etc.); spores tetrahedral or (in most African species) bilateral; ca. 30 species in the Old World tropics.

Polytaenium Desv. Mém. Soc. Linn. Paris 6: 218. 1827. Type: *P. lanceolatum* (Sw.) Desv. = *P. lineatum* (Sw.) J. Sm.

Costa extending to the apex of the lamina, or nearly so; paraphyses absent; spores tetrahedral; 10 species in the American tropics.

Scoliosorus Moore, Ind. Fil. xxix. 1857. Type: *S. ensiformis* (Hook.) Moore.

Costa extending to the apex of the lamina, or nearly so; paraphyses present, with enlarged, rounded apical cells; spores bilateral; 1 species in Mexico and Central America.

The classification of *Scoliosorus* as a separate genus is not satisfactory for it has little, if any, claim to be a monotypic

¹BENEDICT, R. C. Bull. Torrey Cl. 34: 446-447. 1907.

²CHRISTENSEN, C. in Verdoorn, Man. Pterid. 539. 1938.

³BENEDICT, R. C. Bull. Torrey Cl. 38: 169, 174. 1911.

⁴COPELAND, E. B. Genera Filicum. 223-225. 1947.

genus since it has no characters that are not found in *Antrophyum* or *Polytaenium*. *Scoliosorus* is closely related to species of *Antrophyum*, some of which have similar paraphyses or spores or only a somewhat less developed costa. Its complete costa is the only character that would place it closer to *Polytaenium*. If two genera are to be recognised, then *Scoliosorus* must be united with *Antrophyum* rather than with *Polytaenium*.

Since the three taxa are all closer to each other than to any related genus, there can be no serious objection to treating them in the single genus *Antrophyum*. This classification, however, has the disadvantage of obscuring their relationship and geography.

The evolutionary relations of the taxa and their geography are presented to the best advantage by the recognition of *Antrophyum* (including *Scoliosorus*) and of *Polytaenium*. *Antrophyum*, then, is a paraphysate genus of the Old World with a single species in Mexico and Central America; and *Polytaenium* is a non-paraphysate American genus. The distribution of *Antrophyum* is a significant one and is similar to other fern genera such as *Coniogramme*, *Loxogramme*, and *Culcita*. *Coniogramme mexicana* (Mexico and Guatemala) is the only American species of a genus represented by about 20 species through the Old World tropics; *Loxogramme mexicana* and *L. Salvinii* (Mexico to Panama) are the American species of a genus of about 35 species in the Old World; and *Culcita coniifolia* (Central America, Hispaniola, Andean South America) is the American representative of a genus of about 8 species in the paleotropics.

There are three species of *Polytaenium* with a broad lamina that are widely distributed in South America. A study of type specimens has revealed that some of the names have been applied incorrectly. The following notes deal with the nomenclature of these species in terms of the present taxonomy although it is evident that this group is in some need of revision. It is worth remarking that Hieronymus (in the herbarium at Berlin-Dahlem) has evidently been the only one to apply the names correctly. His discussion of the

species⁵, however did not adequately bring out their characters; and some of the characters he mentions have proved to be of little value.

Polytaenium cajenense (Desv.) Benedict, Bull. Torrey Cl. 38: 169. 1911.

Hemionitis cajenensis Desv. Ges. Naturf. Freunde Berl. Mag. 5: 311. 1811, as *cajanensis* on holotype, in Jour. Bot. Appl. 1: 274. 1813 and in Mém. Soc. Linn. Paris. 6: 216. 1827. Holotype: French Guiana, Herb. Desv., P! (The collector is not known, but the two leaves of the holotype were doubtless obtained from the collections at Paris, perhaps from that of *Joseph Martin*, French Guiana P!. If this is true, there is an isotype at B! (Herb. Willd. no. 19560). This was marked "type" by Hieronymus but I do not know on what evidence). *Sintenis 6554*, Porto Rico (P) and *Türckheim II 249* in 1913 (P), Guatemala closely match the holotype.

Antrophyum cajenense (Desv.) Spreng. Syst. Veg. 4: 67. 1827, as *cayennense*.

Antrophyum discoideum Kze. Bot. Zeit. 6: 702. 1848. Lectotype: Colombia, *Karsten 30*, LZ, destroyed, duplicate B!, photo GH. The other collection cited by Kunze, *Funck & Schlim* (Coll. Fil. *Linden 303*), BM!, P! is *P. brasilianum*. The choice of type is arbitrary.

Antrophyum subsessile var. *elongatum* Mett. Ann. Sci. Nat. V, 2: 208. 1864, based on *A. discoideum* Kze.

Antrophyum brasilianum var. *elongatum* (Mett.) Hieron. Hedwigia 48: 247. 1909.

Polytaenium discoideum (Kze.) Benedict, Bull. Torrey Cl. 38: 169. 1911.

Antrophyum brasilianum and *Polytaenium brasilianum* of most herbaria.

Lamina papyraceous to usually coriaceous, broadly to narrowly oblanceolate, with the apical half broader and more abruptly tapering than the basal half which gradually tapers to the usually strongly alate petiole which is greenish beneath (sometimes drying to light or dark brown) and concolorous or darker than the adjacent leaf-tissue.

Guatemala to Panama; Greater Antilles; Guianas to Venezuela and Colombia, south to Bolivia and Brazil.

Representative specimens: GUATEMALA: *Türckheim II 249* in 1913. COSTA RICA: *Cooper (J. D. Sm. 6019)*. CUBA: *Shafer 8840*. PUERTO RICO: *Sintenis 6554*. VENEZUELA: *Fendler 305*. COLOMBIA: *Karsten 30*. PERU: *Schunke 283*, *Poeppig 182*.

Desvaux's epithet *cajenense* has usually been applied incorrectly to the common species of the Guianas which is *P. guayanense* (Hieron.) Alston; while the present species

⁵HIERONYMUS, G. Hedwigia 57: 213-214. 1915.

has generally been named *P. brasilianum*. A careful examination of the holotype of *Hemionitis cajenensis*, however, leaves no doubt as to its identity. Although there is good evidence that Desvaux preferred (and perhaps intended) the spelling *cajanensis*, I follow the Code in maintaining the spelling as originally published.

***Polytaenium brasilianum* (Desv.) Benedict, Bull. Torrey Cl. 38: 169. 1911.**

Hemionitis brasiliana Desv. Mém. Soc. Linn. Paris. 6: 216. 1827. Holotype: Brazil, Herb. Desv. P!, photo GH, US. (The single leaf was probably taken from *Gaudichaud*, Rio de Janeiro, in 1818, P!; it is a close match, except for its more abruptly attenuate apex, for one of the large leaves of *R. S. Williams 1355*, Bolivia).

Hemionitis reticulata var. *brasiliansis* Raddi, Pl. Bras. Nov. Gen. 1: 8. 1825, probably belongs here. Holotype: Brazil, *Raddi*, presumably at FI.

Antrophyum subsessile Kze. Analect. Pterid. 29. 1837, nom superfl. (*illegit.*) for *Hemionitis brasiliana* Desv.

Antrophyum brasilianum (Desv.) C. Chr. Ind. Fil. 59. 1905.

Antrophyum discoideum and *Polytaenium discoideum* of most herbaria.

Lamina papyraceous, oblanceolate, with the apical half broader and more abruptly tapering than the basal half which gradually tapers to the strongly alate petiole which is more or less straw-colored beneath and lighter than the adjacent leaf-tissue.

Venezuela, Colombia, Bolivia and Brazil.

Representative specimens: VENEZUELA: *Funck & Schlim 303*. BOLIVIA: *R. S. Williams 1355*. BRAZIL: *Martius 369*.

Desvaux's epithet *brasiliana* clearly belongs with this species although it has been commonly applied to the previous one, *P. cajenense*.

***Polytaenium guayanense* (Hieron.) Alston, Kew Bull. 1932: 314.**

Antrophyum guayanense Hieron. Hedwigia 57: 212. 1915. Lectotype: Trinidad, *Fendler 151 B!*

Antrophyum cajenense and *Polytaenium cajenense* of most herbaria.

Lamina usually papyraceous to rarely coriaceous, narrowly elliptical or with nearly parallel sides, with the apical and basal halves equally broad and tapering (or nearly so), the basal half rather abruptly tapering to the narrowly alate petiole which is more or less straw-colored beneath and lighter than the adjacent leaf-tissue.

Guianas to Trinidad, Colombia, Peru and adjacent Brazil.

Representative specimens: FRENCH GUIANA: *Leprieur 108*, *Sagot 1119*. TRINIDAD: *Fendler 151*. PERU: *Tryon & Tryon 5300*, *Spruce 3933*.

Antrophyum Jenmanii Benedict, Bull. Torrey Cl. 34: 454. 1907 (*Polytaenium Jenmanii* (Benedict) Benedict, Bull. Torrey Cl. 38: 169. 1911) is an earlier name than that of Hieronymus and may apply to the same species. It is poorly known and at least in part (*Leprieur 109*, GH, P) it seems to be a variable species and somewhat intermediate between the three species treated here. Until the taxonomy is better understood, I do not feel it wise to alter the taxon or to replace Hieronymus's clearly applied name.

2. THE NAMES OF SOME AMERICAN SPECIES OF VITTARIA.

A study of the type specimens of certain names of *Vittaria* has resulted in additional information about them and their identity. These matters, when they affect the correct name of a species, are presented below.

"*Vittaria graminifolia* Kaulf. Enum. Fil. 192. 1824.

Holotype: "Brasil, Otto comm.", LZ, destroyed. Lectotype: Brazil, *Sello B!*

Vittaria filifolia Fée, Mém. Fam. Foug 3 (Hist. Vittar.): 20. 1851-52. Lectotype: "Flore de la Guadeloupe, *Herbier L'Herminier, Vittaria filifolia* Fée, hist. des vittar. p. 20," Herb. Cosson, P!

Although the name *Vittaria graminifolia* was earlier used for the species later described as *V. filifolia*, the latter name gradually replaced it. This is probably due to the fact that Fée's description, illustrations and specimen citations made his species and the application of his name quite certain, while the description of Kaulfuss was rather inadequate and the single specimen cited was not readily available for comparison and study. Maxon, for example,⁶ cites Kaulfuss' name as a questionable synonym of *V. filifolia*. An investigation of the identity of *V. graminifolia* has led me to the conclusion that it represents the same species as *V. filifolia* and that it must be reinstated as the correct name for that species. Since the holotype of *V. graminifolia* is now lost, some discussion of its probable identity and my reasons for selecting the Sello collection as a lectotype are presented below.

⁶MAXON, W. R. Pteridophyta in Sci. Surv. Porto Rico & Virgin Is. 6: 403. 1926.

Both G. Kunze and G. Mettenius had access to the Kaulfuss herbarium at Leipzig and both of them applied the name *V. graminifolia* to specimens such as *Burchell 2288* and *Linden 168*, among numerous others (B, BM, P) which are the species later called *V. filifolia*. A label in Herb. Mettenius, B, proves that he had studied the holotype of *V. graminifolia*. This label bears the data "V. graminifolia Klf. p. 1688 Brasilia Otto spores tetrahedrico-globose. Paraphyses cellule terminales clavata . . . (word obscure) non punctata" (A later hand wrote "Zeffel ohne Pflanze in Herb. Mett."). Mettenius' usage of the name must then be given some weight. It is also important that the few characters of the holotype indicated (supplementing the original description) are consistent with those of the species in question.

The source of the Brazilian material which Otto sent to Kaulfuss is not known but was possibly a Sello collection. I am designating the specimen at Berlin as a lectotype on the assumption that it is part of the original collection. This action seems preferable to that of choosing a neotype because of the possibility of the existence of an isotype.

The identity of *Vittaria filifolia* is clear. The description, illustrations and specimens cited by Fée all agree with the species as it is currently interpreted. I have seen three of the six collections cited by Fée, *Linden 168*, BM, *Galeotti 6337*, W and *L'Herminier* (several sheets at P), and from these I have chosen one as a lectotype.

Vittaria graminifolia grows in Mexico, through Central America, in the Greater Antilles and in some of the Lesser Antilles, and from Surinam to Venezuela, Colombia and Bolivia, also in Brazil.

The following selected specimens are representative of the species: MEXICO: *Ghiesbreght 255*, *Hinton 6162*, *7369*, *14231*, *14272*, *15496*, *Purpus 6731*. GUATEMALA: *Tuerckheim 811*, *8338*, II *541*, II *1382*. HISPANIOLA: *Türckheim 2944*, *Ekman H 7709*. VENEZUELA: *Fendler 258*. COLOMBIA: *Lehmann 5023*, *H. H. Smith 1057*. BRAZIL: *Burchell 2288*.

Vittaria Moritziana Mett. Ann. Sci. Nat. V, 2: 207. 1864.

Holotype: Canoas, 2500 m., *Lindig 319 B!*

Vittaria Ruiziana sensu Benedict, Bull. Torrey Cl. 41: 405. 1914.

This species is closely related to *V. stipitata* with which it shares the characters of non-alate, hard and terete or oval petiole. It is separated by the characters of the several-costate rhizome scales and the sporangia that are borne in shallow grooves back from the margin. In *V. stipitata* the rhizome scales are uni-costate and the sporangia are in deep grooves near the margin.

The identity of *Vittaria Moritziana* was correctly interpreted by Benedict (*l.c.*) but he incorrectly applied the earlier name *V. Ruiziana* to the same species.

Costa Rica, Hispaniola, Venezuela to Colombia and south to Bolivia.

The following specimens are representative of the species: COSTA RICA: *Scamman & Holdridge 8112*. HISPANIOLA: *Ekman H 10055, Fuertes 1780*. VENEZUELA: *Fendler 259, Moritz 143, 143b*. COLOMBIA: *Schlim 628, Pennell 9250, Killip & Smith 18770*. ECUADOR: *Mexia 7482*. BOLIVIA: *D'Orbigny 332*.

Vittaria Ruiziana Fée, Mém. Fam. Foug.
3 (Hist. Vittar.): 17. 1851-52.

Holotype Peru, *Ruiz* (not seen). Authentic specimen "Pérou, *Dombey*," B! (photo GH) det. *V. Ruiziana* by Fée. (This specimen "ex Herb. Mus. Paris" is doubtless a part of "Pteris lineata L. Huasi-Huasi, *Dombey*, in 1779" P).

Pteropsis vittarioides Desv. Mém. Soc. Linn. Paris 6: 219. 1827. Holotype: Peru, Herb. Desv., P! (The single leaf was undoubtedly taken from "Pteris lineata L. Huasi-Huasi, *Dombey*, in 1779," P; a duplicate with the same data but the year omitted and "*Vittaria lancea* Desv." added is at B! (Hb. Kunth), photo GH.

Vittaria Orbignyana Mett. ex Kuhn, Linnaea 36: 66. 1869. Holotype: Yungas, Bolivia, *D'Orbigny 229 B!* (photo GH). Isotype: GH! P! (a much better specimen).

Vittaria vittarioides (Desv.) Weath. Contrib. Gray Herb. 114: 34. 1936, not (Thouars) C. Chr. Ind. Fil. 655. 1907.

Although Benedict (*l.c.*) used the name *V. Ruiziana*, he applied it to another species (*V. Moritziana*) and did not include the present species in his treatment. *Vittaria Ruiziana* is related to *V. remota*, *V. Gardneriana* and *V. latifolia*

in its narrowly alate, flattened and soft petiole. It differs from the first two in lacking a costal ridge at the base of the linear lamina, and from the last one by the shape of the lamina and the characters of the rhizome scales.

I have not seen the Ruiz collection cited by Fée in several of the herbaria that might have it; an isotype may be sought especially at MA or FI. The specimen at B annotated by Fée agrees with the original description and illustration and it may properly be taken to represent the name until an isotype is found.

Vittaria Ruiziana is evidently a rather rare species of the Andes from Venezuela to Bolivia.

Representative specimens: VENEZUELA: *Jahn 918* (in part). COLOMBIA: *Pennell & Killip 6488, 7354*. ECUADOR: *Jameson 20* (in part). PERU: *Vargas 1588, 11157, Macbride 4136*. BOLIVIA: *Steinbach 6173, D'Orbigny 229*.

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